

2006 Buick Lucerne CXS

2006 ENGINE Engine Mechanical - 4.6L (2 Of 5) - Lucerne

2006 ENGINE**Engine Mechanical - 4.6L (2 Of 5) - Lucerne****SPECIFICATIONS****FASTENER TIGHTENING SPECIFICATIONS****Fastener Tightening Specifications**

Application	Specification	
	Metric	English
Air Conditioning Compressor		
• Front Bolt - In Sequence	50 N.m	37 lb ft
• Front Nut - In Sequence	50 N.m	37 lb ft
• Mounting Stud to Block	25 N.m	18 lb ft
• Side Lower Bolt - In Sequence	25 N.m	18 lb ft
• Side Upper Bolt - In Sequence	50 N.m	37 lb ft
Air Conditioning Compressor		
• Discharge Hose Nut	20 N.m	15 lb ft
• Suction Hose Nut	20 N.m	15 lb ft
AIR Valve Bracket		
• Bolt	9 N.m	80 lb in
• Nut	9 N.m	80 lb in
• Intermediate Hose Nut	9 N.m	80 lb in
Battery Positive Cable to Remote Positive Terminal Nut	12 N.m	106 lb in
Brake Pipe	15 N.m	11 lb ft
Brake Pipe Frame Bracket Nut	15 N.m	11 lb ft
Camshaft Bearing Cap Bolt		
• First Pass	5 N.m	44 lb in
• Final Pass	+30 degrees	
Camshaft Cover Bolt	10 N.m	89 lb in
Camshaft Drive Chain Guide Access Plug	4.5 N.m	39 lb in
Camshaft Intermediate Drive Shaft		
• Bolt	15 N.m	11 lb ft
• Sprocket Bolt	60 N.m	44 lb ft
Camshaft Position Sensor Bolt	10 N.m	89 lb in

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• Valve Seat Width	26.23 mm	1.0327 in
• Valve Spring Free Length	40.300-43.690 mm 1.6039-1.7201 in	0.0512-0.0669 in
• Intake Valve Spring Height	0.420-0.820 mm	0.0165-0.0323 in
• Valve Stem Diameter	5.920-5.940 mm	0.2331-0.2339 in
• Closed Valve Stem Out-of-Round	35.000 mm	1.3780 in
• Open Valve Stem Straightness	0.008 mm	0.0003 in
• Valve Spring Load	24.500 mm	0.9646 in
• Valve Stem-to-Guide Clearance	0.013 mm	0.0005 in
• Closed Exhaust	211.4-233.4 N	47.5-52.4 lb
• Open Production	579.0-631.0 N	130.2-141.9 in
• Valve Spring Total Number of Coils	0.050-0.100 mm 6.90-7.10	0.0020-0.0039

SEALERS, ADHESIVES AND LUBRICANTS

Sealers, Adhesives and Lubricants

Application	Type of Material	GM Part Number	
		United States	Canada
Camshaft Prelube	Lubricant	12345501	992704
Crankshaft Prelube	Lubricant	1052367	992869
Crankshaft Rear Oil Seal at Split Lines	Sealant	12378521	88901148
Crankshaft Rear Oil Seal Outer Diameter	Lubricant	12345501	992704
Engine Flywheel Bolt	Sealant	12346004	10953480
Engine Front Cover at Split Lines	Sealant	12378521	88901148
Engine Front Cover Bolt	Threadlock	12345382	10953489
Fuel Injector Bores	Lubricant	12345610	993193
Ignition Coil Spark Plug Boot	Lubricant	12345579	1974984
Oil Distribution Plate at Outer Seal	Sealant	12378521	88901148
Oil Filter Adapter Pipe Fitting	Threadlock	89021297	10953488
Oil Pan	Sealant	12378521	88901148
Oxygen Sensor	Lubricant	12377953	N/A
Upper-to-Lower Crankcase	Sealant	12378521	88901148
Valve Lifter	Lubricant	12345616	993182

THREAD REPAIR SPECIFICATIONS

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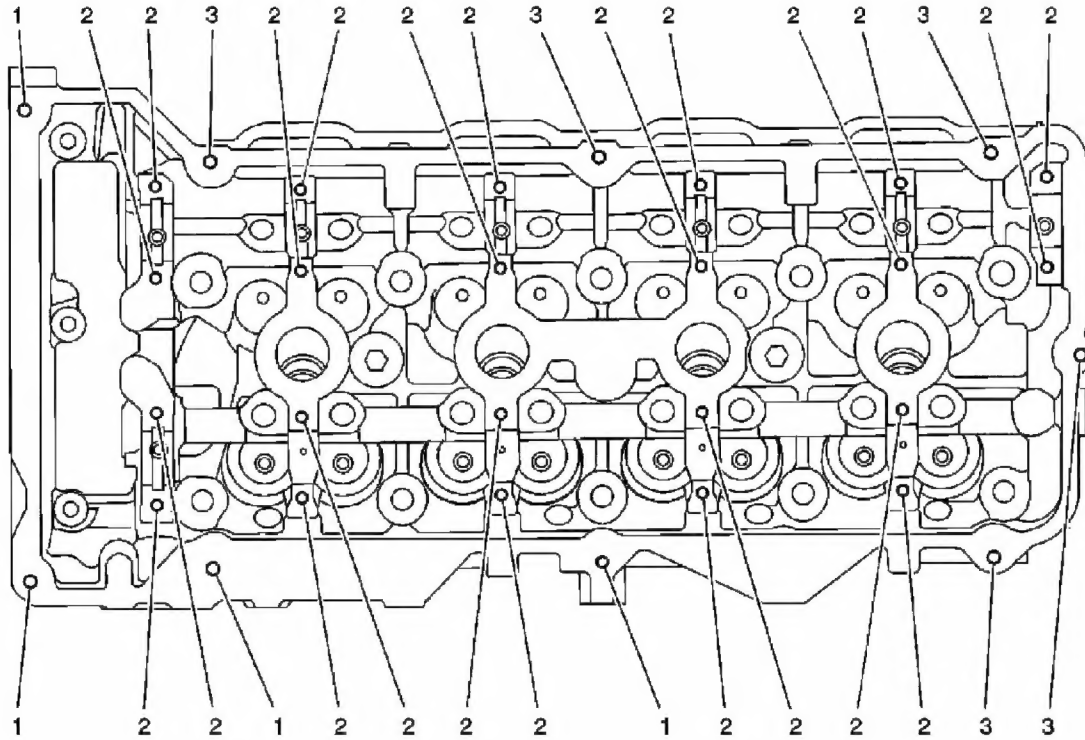


Fig. 1: Locating Left Cylinder Head Camshaft Cover Face Specifications
 Courtesy of GENERAL MOTORS CORP.

Left Cylinder Head Camshaft Cover Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-			J 42385-				MM	(IN)	MM	(IN)
1	6 x 1.0	201	202	N/A	203	204	205	22	0.866	18	0.709
2	6 x 1.0	608	N/A	N/A	203	204	205	26	1.024	22	0.866
3	6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	

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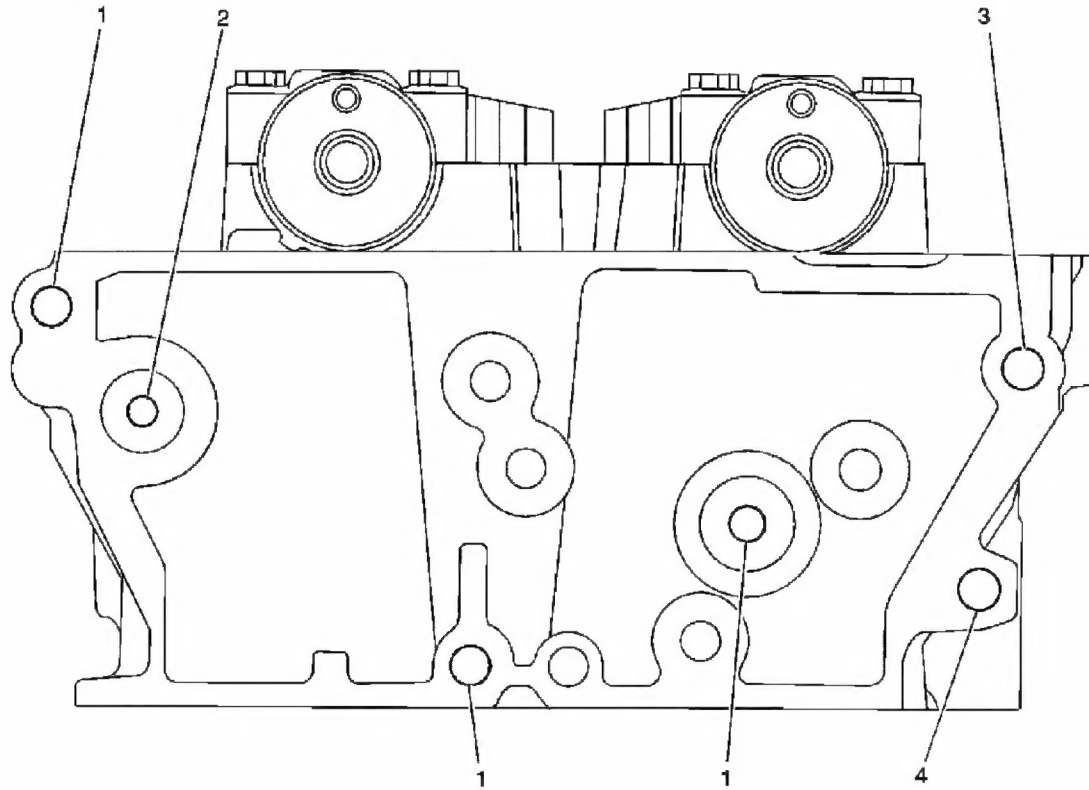


Fig. 2: View Of Left Cylinder Head Front Face
Courtesy of GENERAL MOTORS CORP.

Left Cylinder Head Front Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-			J 42385-				MM	(IN)	MM	(IN)
1	10 x 1.5	211	212	N/A	213	214	215	32	1.260	26	1.024
2	10 x 1.5	211	212	N/A	213	214	215	28	1.102	22.5	0.886
3	8 x 1.25	610	N/A	619	208	209	620	THRU		THRU	
4	8 x 1.25	610	N/A	619	208	209	620	25	0.984	20	0.787

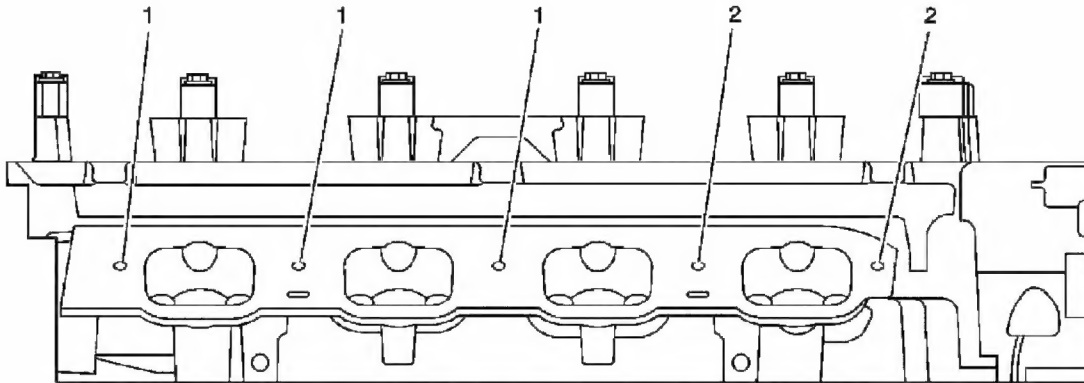


Fig. 3: View Of Left Cylinder Head Intake Face
Courtesy of GENERAL MOTORS CORP.

Left Cylinder Head Intake Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-	J 42385-						MM (IN)		MM (IN)	
1	6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
2	6 x 1.0	201	202	N/A	203	204	205	25	0.984	21.25	0.837

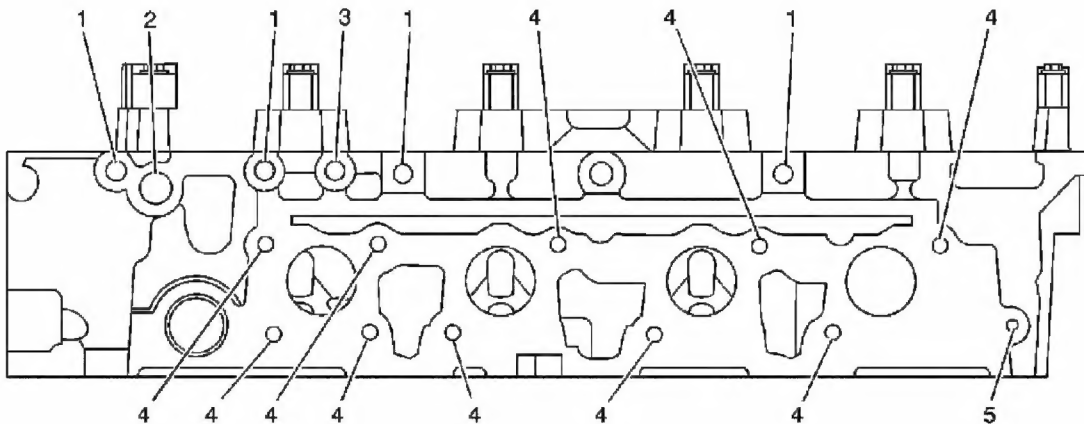


Fig. 4: View Of Left Cylinder Head Exhaust Face
Courtesy of GENERAL MOTORS CORP.

Left Cylinder Head Exhaust Face

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2 ¹	1.5	861	Counter	N/A	863	864	860	20	0.787	16	0.630
3	8 x 1.25	206	207	N/A	208	209	210	27	1.063	22	0.866

¹ Hole 2 will require that the oil passage hole be redrilled

Fig. 6: View Of Right Cylinder Head Camshaft Cover Face
Courtesy of GENERAL MOTORS CORP.

Right Cylinder Head Camshaft Cover Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-			J 42385-				MM	(IN)	MM	(IN)
1	6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
2	6 x 1.0	201	202	N/A	203	204	205	22	0.866	18	0.709
3	6 x 1.0	608	N/A	N/A	203	204	205	26	1.024	22	0.866

Fig. 7: View Of Right Cylinder Head Front Face
Courtesy of GENERAL MOTORS CORP.

Right Cylinder Head Front Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
-	-			J 42385-							
1	10 x 1.5	211	212	N/A	213	214	215	32	1.260	26	1.024
2	6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
3	8 x 1.25	206	207	N/A	208	209	210	THRU		THRU	
4	8 x 1.25	610	N/A	619	208	209	620	25	0.984	20	0.787



Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-			J 42385-				MM (IN)		MM (IN)	
1	6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
2	6 x 1.0	201	202	N/A	203	204	205	25	0.984	21.25	0.837

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1	8 x 1.25	206	207	N/A	208	209	210	25	0.984	20	0.787
2	10 x 1.5	211	212	N/A	213	214	215	32	1.260	26	1.024
3	16 x 1.5	861	862	N/A	863	864	860	20	0.787	16	0.630

Fig. 10: View Of Right Cylinder Head Rear Face
Courtesy of GENERAL MOTORS CORP.

Right Cylinder Head Rear Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-			J 42385-				MM	(IN)	MM	(IN)
1	16 x 1.5	861	862	N/A	863	864	860	20	0.787	16	0.630
2	10 x 1.5	211	212	N/A	213	214	215	32	1.260	26	1.024
3	10 x 1.5	211	212	N/A	208	214	215	32	1.260	26	1.024
4	8 x	206	207	N/A	208	209	210	27	1.063	22	0.866

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Hole Location	1.25 Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap 2	Driver	Insert	Drill Depth (Maximum)	Tap Depth (Minimum)
	NPSF								

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3	6 x 1.0	201	202	N/A	203	204	205	24	0.945	17	0.669
4	6 x 1.0	201	202	N/A	203	204	205	THRU		17	0.669
5	10 x 1.5	211	212	N/A	213	214	215	33	1.299	27	1.063
6	8 x 1.25	206	207	N/A	208	209	210	THRU		THRU	
7	6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
8	10 x 1.5	211	212	N/A	213	214	215	THRU		THRU	
9	8 x 1.25	610	N/A	619	208	209	620	THRU		THRU	
10	6 x 1.0	201	202	N/A	203	204	205	THRU		15.5	0.610
11	8 x 1.75	2001	2002	N/A	2003	2004	2005	26	1.024	21	0.827

Fig. 12: View Of Engine Block Left Side
Courtesy of GENERAL MOTORS CORP.

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Engine Block Left Side

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-			J 42385-				MM	(IN)	MM	(IN)
1	10 x 1.5	211	212	N/A	213	214	215	30	1.181	24	0.945
2	6 x 1.0	608	N/A	N/A	203	204	205	27.5	1.083	22.5	0.886
3	6 x 1.0	201	202	N/A	203	204	205	THRU		21	0.827
4	8 x 1.25	610	N/A	N/A	207	208	620	30	1.181	25	0.984
5	8 x 1.25	206	207	N/A	208	209	210	20	0.787	16	0.630
6	8 x 1.25	206	207	N/A	208	209	210	25	1.020	20	0.787

Fig. 13: View Of Engine Block Right Side
Courtesy of GENERAL MOTORS CORP.

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Engine Block Right Side

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-			J 42385-				MM	(IN)	MM	(IN)
1	10 x 1.5	211	212	N/A	213	214	215	30	1.181	24	0.945
2	6 x 1.0	608	N/A	N/A	203	204	205	27.5	1.083	22.5	0.886
3	10 x 1.5	211	212	N/A	213	214	215	33	1.299	27	1.063

Fig. 14: View Of Engine Block Rear
Courtesy of GENERAL MOTORS CORP.

Engine Block Rear

Hole	Thread		Counter Bore	Stop				Drill Depth	Tap Depth
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Location	Size	Drill	Tool	Collar	Tap	Driver	Insert	(Maximum)		(Minimum)	
-	-			J 42385-				MM (IN)		MM (IN)	
1	12 x 1.75	856	857	N/A	858	859	855	THRU		THRU	
2	8 x 1.25	206	207	N/A	208	209	210	THRU		THRU	
3				No Service-Not Threaded							
4	8 x 1.25	206	207	N/A	208	209	210	30	1.181	24	0.945
5	8 x 1.25	206	207	N/A	208	209	210	THRU		24	0.945

Fig. 15: View Of Engine Block Top
Courtesy of GENERAL MOTORS CORP.

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Engine Block Top

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
-	-	J 42385-									
1	6 x 1.0	201	202	N/A	203	204	205	20.0	0.7874	16.0	0.6299
2	8 x 1.25	206	207	N/A	208	209	210	23.5	0.9250	18.5	0.7280
3	8 x 1.25	206	207	N/A	208	209	210	23.0	0.9055	19.0	0.7480
4	10 x 1.5	211	212	N/A	213	214	215	31.5	1.2400	26.5	1.0820
5	6 x 1.0	201	202	N/A	203	204	205	23.0	0.9055	19.0	0.7480

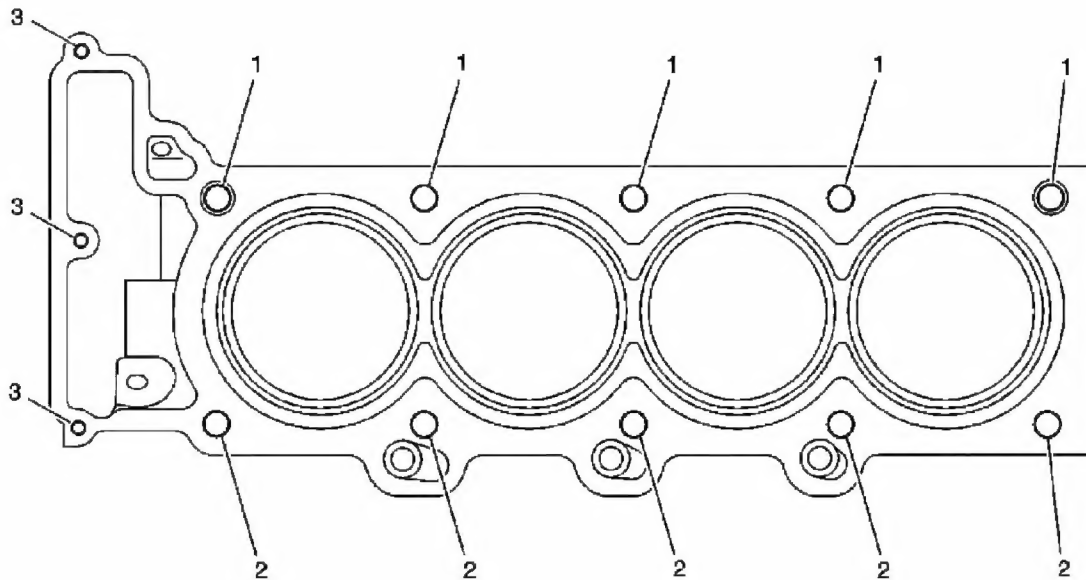


Fig. 16: View Of Engine Block Left Deck Face
Courtesy of GENERAL MOTORS CORP.

Engine Block Left Deck Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-	J 42385-						MM	(IN)	MM	(IN)
1	11 x 2.0	2031	N/A	2034	2032	2033	108	73	2.874	67	2.638
2	11 x 2.0	2031	N/A	N/A	2032	2033	108	89.5	3.524	83.5	3.287

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3	6 x 1.0	608	N/A	N/A	203	204	205	30	1.181	25	0.984
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Fig. 17: View Of Engine Block Right Deck Face
Courtesy of GENERAL MOTORS CORP.

Engine Block Right Deck Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-	J 42385-						MM	(IN)	MM	(IN)
1	11 x 2.0	2031	N/A	2034	2032	2033	108	73	2.874	67	2.638
2	10 x 1.5	211	212	N/A	213	214	215	31.5	1.240	26.5	1.082
3	6 x 1.0	608	N/A	N/A	203	204	205	30	1.181	25	0.894
4	11 x 2.0	2031	N/A	N/A	2032	2033	108	89.5	3.524	83.5	3.287

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Fig. 18: View Of Engine Block Lower Face
Courtesy of GENERAL MOTORS CORP.

Engine Block Lower Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
-	-	J 42385-						MM	(IN)	MM	(IN)
1	10 x 1.5	511	N/A	N/A	512	513	514	32	1.260	26.5	1.043
2	8 x 1.25	610	N/A	N/A	208	209	620	THRU		THRU	
3	8 x 1.25	610	N/A	N/A	208	209	620	37	1.457	32	1.260

IMPORTANT:

Items required for Main Bearing repair (3) 510 bolts (1) 306 Plate SPX (1) 307 bushing (1) 308 alignment pin